



PROCEEDINGS BOOK

OF THE

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9th Congress of Croatian & Hungarian Geomathematicians
“Geomathematics in multidisciplinary science -
The new frontier?”

2017



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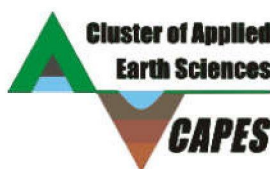
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SCIENTIFIC PROGRAM

Wednesday (10.05) – Geostatistics today – pre-conference short course by János Geiger

Thursday (11.05) –

09:00- Registration

11:00-11:30 Opening ceremony with speeches by:

Ferenc Fedor - President of the Geomathematical & Informatics Section of the HGC

Tamás Síkfői - President of the Chamber of Commerce and Industry of Pécs-Baranya

Zoltán Unger - Associate President of the Hungarian Geological Society

11:30-12:00 Opening lecture by János Geiger - Statistical Process Control in The Evaluation of Geostatistical Simulations

13:00-14:30 Climate modelling past and future – chair: István G. Hatvani

- Keynote speaker: **Gabriella Szépszó** - **Climate adaptation in Hungary: from the climate model outputs to the end-users**
- **Dániel Topál** Detecting breakpoints in annual $\delta^{18}\text{O}$ ice core records from North Greenland
- **Csaba Ilyés** Examination of 110 year long Rainfall Data using Spectral and Wavelet Analysis
- **Tímea Kalmár** Regional climate modelling with special focus on the precipitation-related fine scale processes
- **Péter Szabó** Sources of uncertainties in climate model results

15:00-17:30 (with break) Big data in geoscience – chair: Zoltán Nagy

- Keynote speaker: **Balázs Székely** - **Big data in geoscience – are we big enough to use and to understand that properly?**
- **Zoltan Nagy** The Repository Information Model
- **Éva Farics** Determination of sedimentological processes of a coarse-grained deposits in Buda Hills applying combined cluster and discriminant analysis
- **László Sőrés** How to Document Scientific Work? Preserving Memories for the Semantic Web
- **László G. Somos** Statistic evaluation of digitized geophysical well logs data. (Digitized logs, Statistical evaluation, Multi-correlation)
- **Gyula Mező** Use of Sequential Gaussian Simulation for modelling groundwater pathlines and travel times near an underground radioactive waste repository
- **Tamás Miklovicz** Application of 3D geological modelling and grade tonnage calculations on Recsk ore complex
- **Ágnes Krupa** “Data-Mine” software: Complex earth scientific documentation of excavations with a uniform, real 3D background

Friday (12.05) –

08:30-10:30 (with break) Mathematical aspects of reservoir geology – chair: János Geiger

- Keynote speaker: **Marko Cvetković - Geomathematical aspects of reservoir and exploration geology**
- **István Nemes** From Russia with love – On production since 1947
- **Szabolcs Borka** Handling a mature clastic HC reservoir without seismic – trends, facies proportions and depositional zones
- **János Blahó** Permeability problematics in modelling of highly heterogeneous reservoirs
- **Ivona Emanović** Variogram analysis of well derived lithofacies data in Eastern part of Drava Depression
- **Zsolt Kovács** Evaluation of the trends of hydrocarbon migration processes based on oil density - reservoir depths relationship in Hungary

11:00-12:15 Geomathematics in water quality protection – chair: Balázs Trásy

- Keynote speaker: **József Kovács - Determining Water-Bodies Using Multivariate Data Analysis Methods**
- **Zsuzsanna Szabó** A reactive transport model of CO₂ and brine inflow to a fresh water aquifer
- **István G. Hatvani** Estimation of chlorophyll-a in rivers, on the example of the River Danube and Tisza
- **Péter Tanos** Combined Cluster and Discriminant Analysis on the River Raab's Austrian and Hungarian sections

13:30-15:00 Data analysis in engineering geology – chair: László Kovács

- Keynote speaker: **Ákos Török - Geomathematical aspects of engineering geology**
- **Balázs Czinder** Statistical analyses of strength parameters and aggregate properties of andesites from Hungary
- **Nikoletta R.-Boissinot** Evaluation of curve characteristics of shear strength along discontinuities using state-of-the-art breakpoint detection methods
- **Alina Vattai** Effect of JRC value on shear strength along discontinuities of Hungarian sandstones
- **Dániel Borbély** Permeability of rock mass around a radioactive waste repository tunnel

15:30-17:15 System theory, future of geology & geoinformatics – chair: Péter Tanos

- Keynote speaker: **Sándor Molnár- The qualitative assessment of structured systems**
- **Viktor Feurer** The 3rd/4th industrial revolution - Challenges for researchers –
- **Ferenc Fedor** How to automate a petrophysical laboratory? - challenges and solutions

- **Neven Trenc** Application of semi-automated GIS procedure for river terrace delineation on high resolution LiDAR data in Sava river valley west of Zagreb, Croatia – First results
- **Ana Brcković** Application of artificial neural networks for lithofacies determination in absence of sufficient well data
- **Nikolina Mijic** Quarry Surveying and Analysis Using Drone-mounted LiDAR & AutoCAD Civil 3D

Saturday (13.05) –

08:45-10:15 Poster session – chair: Marko Cvetković

- **Janina Horváth** Application of cluster vs. directional classification method to identify lithofacies and sedimentary elements
- **Tímea Kocsis** Comparison of parametric and non-parametric time-series analysis methods on a long-term meteorological dataset
- **Dániel Erdélyi** Variogram analysis of precipitation $\delta^{18}O$ over the Iberian Peninsula on a monthly-, seasonal- and annual scale
- **Artúr Kóhler** Trends in contaminant concentration time series
- **Shwan O. Hussein** The geographical evolution of urban greenness in the city of Erbil based on Landsat imagery
- **Norbert Magyar** Combined Cluster and Discriminant Analysis, an efficient tool in taxonomical classification
- **Zsuzsanna Szabó** A numerical model of Na-montmorillonite validated by batch experiments
- **Gábor Somodi** Relationship between geotechnical parameters and discrete fracture network simulation results in Bataapáti National Radioactive Waste Repository
- **Sándor Gulyás** Data acquisition, pre-processing of 3D image data of artificially distorted skulls, archaeological artefacts, fossils for 3D geometric morphometric analysis using CT and laser scanning: a comparison

10:30-12:30 Geomathematics in applied geosciences – chair: Ferenc Fedor

- **Keynote speaker: Zoltán Unger - Fault Statistics and Fractal Geometry**
- **Dorottya Kovács** Image processing for fractal geometry-based Discrete Fracture Network modelling input data
- **Tamás Jaskó** Quantitative Determination of Standard Sphericity and Roundness
- **Noémi Jakab** Determining the sufficient number of stochastic realisations to represent spatial uncertainty
- **Mihály Apró** Spatial uncertainty quantification using distance-Kernel method
- **László Z.-Sebess** Geothermal potential estimation with Monte Carlo method
- **Mátyás Sanocki** Uncertainty of subsurface uncertainty analysis' – can we mitigate it?

12:30-13:00 Closing ceremony – István G. Hatvani – Ferenc Fedor – Marko Cvetković

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Note: In general, the content of proceedings book has not been proof read by a native English speaker, and that is why solely the authors are responsible for the quality of language usage. However, certain chapters **marked with ‘*’** have gone through English proof reading by Mr. Paul Thatcher, pt.64@live.co.uk.